CLAIMS

1. A clutch for a rotary power tool having a housing, a spindle rotatably mounted within the housing, and a motor for causing rotation of said spindle about a first axis, the clutch comprising:-

a first clutch member adapted to be mounted to said spindle and to rotate therewith and slide relative thereto in a direction substantially parallel to said first axis, said first clutch member having at least one first friction surface inclined in use relative to said first axis for engaging a respective corresponding second friction surface on said spindle as a result of movement of said first clutch member relative to the spindle;

first biasing means adapted to act between said spindle and said first clutch member for biasing said first clutch member towards a stop;

a second clutch member having a first condition in which said second clutch member engages said first clutch member and rotates therewith, and a second condition in which said second clutch member can move relative to said first clutch member; and

second biasing means adapted to act between said first and second clutch members for urging said second clutch member towards said first condition.

2. A clutch according to claim 1, wherein said second clutch member is adapted to be mounted to said first clutch member and to slide relative thereto in a direction substantially parallel to said first axis, said first and second clutch members have cooperating engaging portions, and said second biasing means is adapted to urge said cooperating engaging portions into engagement with each other, such that when a torque applied between said first and second clutch members does not exceed a predetermined value, said cooperating engaging portions engage each other to prevent relative rotation between said first and second clutch members, and when said torque exceeds said predetermined value, axial movement of said second clutch member relative to said first clutch member against the action of said second biasing means occurs to disengage said cooperating engaging portions from each other, thereby permitting relative rotation between said first and second clutch members.

3. A clutch according to claim 2, wherein the first clutch member is adapted to abut the second clutch member, and the cooperating engaging portions comprise a plurality of teeth on said first and second clutch members.

4. A clutch according to claim 3, wherein the teeth are adapted to engage each other by means of cooperating inclined surfaces.

5. A clutch according to any claim 2, wherein the cooperating engaging portions may comprise at least one third friction surface on said first clutch member and at least one fourth friction surface on said second clutch member.

6. A clutch according to claim 1, wherein the first clutch member is a drive gear adapted to be driven by means of the motor.

7. A clutch according to claim 1, wherein the first and/or second biasing means comprise at least one respective compression spring.

8. A clutch according to claim 1, further comprising at least one resilient stop member adapted to engage said first clutch member at said stop.

9. A clutch according to claim 8, wherein said first clutch member further comprises a recess having an inclined surface for engaging at least one said resilient stop member.

10. A clutch according to claim 1, wherein the first clutch member has a pair of said first friction surfaces, each said first friction surface inclined in use relative to said first axis for engaging a respective corresponding second friction surface on the spindle.

11. A clutch for a rotary power tool having a housing, a spindle rotatably mounted within the housing, and a motor for causing rotation of the spindle about a first axis, the clutch comprising:-

a first clutch member adapted to be mounted to the spindle and to rotate therewith and slide relative thereto in a direction substantially parallel to said first axis;

first biasing means adapted to act between said spindle and said first clutch member for biasing said first clutch member towards a stop;

a second clutch member having a first condition in which said second clutch member engages said first clutch member and rotates therewith, and a second condition in which said second clutch member can move relative to said first clutch member;

second biasing means adapted to act between said first and second clutch members for urging said second clutch member towards said first condition; and

at least one resilient stop member adapted to engage said first clutch member at said stop.

12. A clutch according to claim 11, wherein said second clutch member is adapted to be mounted to said first clutch member and to slide relative thereto in a direction substantially parallel to said first axis, said first and second clutch members have cooperating engaging portions, and said second biasing means is adapted to urge said cooperating engaging portions into engagement with each other, such that when a torque applied between said first and second clutch members does not exceed a predetermined value, said cooperating engaging portions engage each other to prevent relative rotation between said first and second clutch members, and when said torque exceeds said predetermined value, axial movement of said second clutch member relative to said first clutch member against the action of said second biasing means occurs to disengage said cooperating engaging portions from each other, thereby permitting relative rotation between said first and second clutch members.

13. A clutch according to claim 12, wherein the first clutch member is adapted to abut the second clutch member, and the cooperating engaging portions comprise a plurality of teeth on said first and second clutch members.

14. A clutch according to claim 13, wherein the teeth are adapted to engage each other by means of cooperating inclined surfaces.

15. A clutch according to claim 12, wherein the cooperating engaging portions comprise at least one first friction surface on said first clutch member and a respective second friction surface on said second clutch member.

20. A clutch according to claim 11, wherein the first and/or second biasing means comprise at least one said resilient stop member.

17. A clutch according to claim 11, wherein said first clutch member further comprises at least one third friction surface inclined in use relative to said first axis for engaging a respective corresponding fourth friction surface on said spindle.

18. A clutch according to claim 17, wherein the first clutch member has a pair of said third friction surfaces, each said third friction surface inclined in use relative to said first axis for engaging a respective corresponding fourth friction surface on the spindle.

19. A clutch according to claim 11, wherein the first clutch member is a drive gear adapted to be driven by means of the motor.

20. A clutch according to claim 11, wherein the first and/or second biasing means comprise at least one respective compression spring.

21. A rotary power tool comprising:-
a housing;
a spindle rotatably mounted within the housing;
a motor for causing rotation of said spindle about an axis; and
a clutch according to any one of the preceding claims mounted to said spindle.

22. A tool according to claim 21 and any one of claims 2 to 5 or 12 to 16, wherein said cooperating engaging portions comprise a tapered projection on one of said first and second clutch member and a tapered groove on the other of said first and second clutch members.

23. A tool according to claim 21, wherein the tool is a hammer.

24. A hammer comprising a spindle capable of being rotatingly driven by a motor via a drive chain, the drive chain comprising an overload spindle clutch which is capable of slipping when a torque which is greater than a predetermined amount is applied to it wherein the clutch comprises a sliding hub which is slidably mounted on the spindle having at least one spline formed along its inner surface which engages with a corresponding trough formed along the length of the spindle characterised in that the trough and the spline are correspondingly tapered along their length.

25. A hammer according to claim 24 wherein the end of the spline adjacent a stop mechanism, which prevents the sliding hub from travelling rearwardly more than a predetermined position due to a biasing force, has an inclined internal surface angle relative to the longitudinal axis of the sliding hub.

26. A hammer according to claim 25 wherein a rubber O-ring is mounted adjacent the end of the spline to prevent the sliding hub from travelling rearwardly more than a predetermined position due to a biasing force.